AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A liquid charging method for charging a liquid container with a liquid, said liquid container being provided with a piezo-electric device for detecting a consumption condition of said liquid in said liquid container, said piezo-electric device having a cavity connecting to an inside of said liquid container and said cavity contacting said liquid, comprising the steps of:

reducing a pressure in said liquid container to a pressure lower than an atmospheric pressure; and

charging said liquid container with said liquid.

2. (original): A liquid charging method according to Claim 1, wherein said pressure reducing step and said liquid charging step are executed in a pressure reducing container.

3. (original): A liquid charging method according to Claim 1,

wherein said pressure reducing step includes sucking and removing an air in said liquid container via an opening formed in said liquid container so as to reduce said pressure in said liquid container, and

wherein said liquid charging step includes charging said liquid container with said liquid via said opening.

4. (original): A liquid charging method according to Claim 1,

wherein said pressure reducing step includes, under a state that a first opening formed in said liquid container is closed, sucking and removing an air in said liquid container via a second opening formed in said liquid container, and

wherein said liquid charging step includes closing said second opening and opening said first opening, and charging said liquid container with said liquid via said first opening.

5. (original): A liquid charging method according to Claim 1, further comprising a step of, at the time of ending of liquid charging into said liquid container, sucking and ejecting a predetermined amount of said liquid from said liquid container.

6. (original): A liquid charging method according to Claim 1, wherein said pressure reducing step and said liquid charging step are executed almost at the same time.

7. (original): A liquid charging method according to Claim 6, wherein a flow rate of an air to be sucked from said liquid container is larger than a flow rate of said liquid to be charged in said liquid container.

8. (original): A liquid charging method according to Claim 1, wherein said liquid charging step is executed while keeping said liquid container warm.

9. (original): A liquid charging method according to Claim 1,

wherein said liquid container has a first liquid containing chamber connecting to an atmospheric air and a second liquid containing chamber connecting to said first liquid containing chamber and provided with said piezo-electric device, said first and second liquid containing chambers being formed by dividing said inside of said liquid container with at least one partition formed in said inside of said liquid container, and

wherein said first and second liquid containing chambers are charged with said liquid respectively by said pressure reducing step and said liquid charging step.

10. (original): A liquid charging method according to Claim 9, wherein, in said liquid charging step, said liquid is charged via an opening formed at a predetermined position in said second liquid containing chamber and then said first liquid containing chamber is charged with said liquid.

11. (original): A liquid charging method according to Claim 9, wherein, in said liquid charging step, said first liquid containing chamber is charged with said liquid and then said second liquid containing chamber is charged with said liquid.

12. (original): A liquid charging method according to Claim 1, wherein said liquid container is a used liquid container.

13. (previously presented): A liquid charging method according to Claim 1, wherein said liquid container has at least one lyophobic part therein which is lyophobic to said liquid in said liquid container.

14. (previously presented): A liquid container comprising:

a container body; and

a piezo-electric device for detecting a consumption condition of a liquid in said container body, said piezo-electric device having a cavity connecting to an inside of said container body and said cavity contacting said liquid;

wherein an internal pressure of said container body is reduced to a pressure lower than an atmospheric pressure, and

wherein said container body is charged with a liquid.

15. (original): A liquid container according to Claim 14, wherein said liquid is ink for an ink jet recording apparatus, and

said liquid container can be mounted to said ink jet recording apparatus in a removable state.

16. (previously presented): A liquid container according to Claim 14, wherein said liquid container has at least one lyophobic part therein which is lyophobic to said liquid in said liquid container.

17. (original): A liquid container according to Claim 16, wherein said piezo-electric device has a vibration area which is in contact with said liquid in said container body, said vibration area being lyophobic to said liquid.

18. (previously presented): A liquid container according to Claim 16, wherein said at least one lyophobic part includes an inner side of said cavity.

19. (previously presented): A method for manufacturing a liquid container comprising the steps of:

preparing a liquid container having a container body for containing a liquid and a liquid feed port for feeding said liquid in said container body to an outside, and a piezo-electric device for detecting a consumption condition of said liquid in said container body, said piezo-electric device having a cavity connecting to an inside of said container body and said cavity contacting said liquid;

forming a lyophobic part in said piezo-electric device, said lyophobic part being lyophobic to said liquid in said container body;

attaching said piezo-electric device to said liquid container; and

charging said container body with said liquid using a liquid charging method, said liquid charging method comprising the steps of reducing a pressure in said container body to a pressure lower than an atmospheric pressure and charging said container body with said liquid.

20. (original): A method for manufacturing a liquid container according to Claim 19, wherein said attaching step is executed after said forming step is executed.

21. (original): A method for manufacturing a liquid container according to Claim 19, wherein said forming step is executed after said attaching step is executed.

22. (original): A method for manufacturing a liquid container according to Claim 19, wherein said preparation step prepares an attaching structure for attaching said piezo-electric device to said liquid container together with said liquid container and said piezo-electric device, wherein said manufacturing method further comprises a step of mounting said piezo-electric device to said attaching structure, and

wherein said piezo-electric device is attached to said liquid container when said attaching structure is attached to said liquid container in said attaching step after said mounting step is executed.

23. (original): A method for manufacturing a liquid container according to Claim 22, wherein said forming step is executed after said mounting step is executed.

24. (original): A method for manufacturing a liquid container according to Claim 23, wherein said forming step is executed after said mounting step and said attaching step are executed.

25. (original): A method for manufacturing a liquid container according Claim 22, wherein said mounting step is executed after said forming step is executed.

26. (previously presented): A liquid container according to Claim 14,

wherein said piezo-electric device detects at least an acoustic impedance of said liquid in said container body, and detects said consumption condition of said liquid on the basis of changes in said acoustic impedance.

27. (previously presented): A liquid container according to Claim 26,

wherein said piezo-electric device includes a vibration part, and

wherein said changes in said acoustic impedance are detected by vibrating said vibration part, and measuring a counter electromotive force generated by a residual vibration remaining in said vibration part to detect a resonance frequency or an amplitude of a counter electromotive force waveform.

28. (previously presented): A liquid container according to Claim 27,

wherein said vibration part is external to said piezo-electric device.

29. (previously presented): A liquid container according to Claim 14,

wherein said container body includes a plurality of liquid containing chambers.

30. (previously presented): A liquid container according to Claim 14,

further comprising a plurality of piezo-electric devices for detecting a consumption condition of a liquid in said container body, each of said piezo-electric devices being provided with a cavity connecting to an inside of said container body.

31. (previously presented): A liquid container according to Claim 14,

wherein said piezo-electric device is installed in said container body at a position slightly above an ink feed port of said container body.

32. (previously presented): A liquid container according to Claim 14,

wherein said container body is provided with a check valve.

33. (previously presented): A liquid container according to Claim 14,

wherein the diameter of said cavity of said piezo-electric device is equal to or less than 1.0 mm.

34. (previously presented): A liquid container according to Claim 29,

wherein the chamber closest to an ink feed port of said container body has the largest volume of said plurality of liquid containing chambers.

35. (previously presented): A liquid charging method according to Claim 1,

wherein said liquid is warmed before said liquid charging step is executed.

36. (previously presented): A liquid charging method according to Claim 9,

wherein said liquid containing chamber is provided with a buffer.

37. (previously presented): A method for manufacturing a liquid container according to Claim 22,

wherein said attaching structure includes a cylindrical part.

38. (new): A liquid charging method according to Claim 1,

wherein said piezo-electric device has a vibrating portion which comes into contact with said liquid in said liquid container via said cavity, said cavity defining an area of said vibrating portion, and

wherein said consumption condition is detected based on a signal output from said piezo-electric device, said signal indicating a residual oscillating state of said vibrating portion, said signal of said residual oscillating state changing based on said consumption condition.

39. (new): A liquid container according to Claim 14,

wherein said piezo-electric device has a vibrating portion which comes into contact with said liquid in said container body via said cavity, said cavity defining an area of said vibrating portion, and

wherein said consumption condition is detected based on a signal output from said piezo-electric device, said signal indicating a residual oscillating state of said vibrating portion, said signal of said residual oscillating state changing based on said consumption condition.

40. (new): A method for manufacturing a liquid container according to Claim 19,

wherein said piezo-electric device has a vibrating portion which comes into contact with said liquid in said liquid container via said cavity, said cavity defining an area of said vibrating portion, and

wherein said consumption condition is detected based on a signal output from said piezo-electric device, said signal indicating a residual oscillating state of said vibrating portion, said signal of said residual oscillating state changing based on said consumption condition.